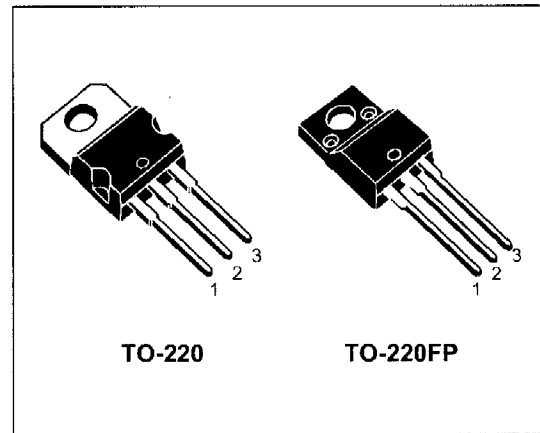


STP36NE06
STP36NE06FP

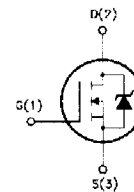
N - CHANNEL 60V - 0.032Ω - 36A - TO-220/TO-220FP
STripFET™ POWER MOSFET

TYPE	V _{DSS}	R _{DS(on)}	I _D
STP36NE06	60 V	< 0.040 Ω	36 A
STP36NE06FP	60 V	< 0.040 Ω	20 A

- TYPICAL R_{DS(on)} = 0.032 Ω
- EXCEPTIONAL dv/dt CAPABILITY
- 100% AVALANCHE TESTED
- LOW GATE CHARGE 100 °C
- APPLICATION ORIENTED CHARACTERIZATION



INTERNAL SCHEMATIC DIAGRAM



APPLICATIONS

- HIGH CURRENT, HIGH SPEED SWITCHING
- SOLENOID AND RELAY DRIVERS
- MOTOR CONTROL, AUDIO AMPLIFIERS
- DC-DC & DC-AC CONVERTERS

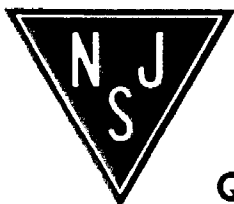
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		STP36NE06	STP36NE06FP	
V _{DS}	Drain-source Voltage (V _{GS} = 0)	60		V
V _{DGR}	Drain- gate Voltage (R _{GS} = 20 kΩ)	60		V
V _{GS}	Gate-source Voltage	± 20		V
I _D	Drain Current (continuous) at T _c = 25 °C	36	20	A
I _D	Drain Current (continuous) at T _c = 100 °C	24	14	A
I _{DM} (*)	Drain Current (pulsed)	144	144	A
P _{tot}	Total Dissipation at T _c = 25 °C	100	35	W
	Derating Factor	0.66	0.27	W/°C
V _{ISO}	Insulation Withstand Voltage (DC)	—	2000	V
dv/dt	Peak Diode Recovery voltage slope	7		V/ns
T _{stg}	Storage Temperature	-65 to 175		°C
T _J	Max. Operating Junction Temperature	175		°C

(*) Pulse width limited by safe operating area

(1) I_{SD} ≤ 36 A, di/dt ≤ 300 A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ T_{JMAX}

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.



STP36NE06FP

THERMAL DATA

		TO-220	TO-220FP	
$R_{thj-case}$	Thermal Resistance Junction-case Max	1.51	4.28	$^{\circ}C/W$
$R_{thj-amb}$	Thermal Resistance Junction-ambient Max	62.5		$^{\circ}C/W$
$R_{thc-sink}$	Thermal Resistance Case-sink Typ	0.5		$^{\circ}C/W$
T_l	Maximum Lead Temperature For Soldering Purpose	300		$^{\circ}C$

AVALANCHE CHARACTERISTICS

Symbol	Parameter	Max Value	Unit
I_{AR}	Avalanche Current, Repetitive or Not-Repetitive (pulse width limited by T_j max)	36	A
E_{AS}	Single Pulse Avalanche Energy (starting $T_j = 25^{\circ}C$, $I_D = I_{AR}$, $V_{DD} = 25V$)	180	mJ

ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	$I_D = 250 \mu A$ $V_{GS} = 0$	60			V
I_{DSS}	Zero Gate Voltage Drain Current ($V_{GS} = 0$)	$V_{DS} = \text{Max Rating}$ $V_{DS} = \text{Max Rating}$ $T_c = 125^{\circ}C$			1 10	μA μA
I_{GSS}	Gate-body Leakage Current ($V_{DS} = 0$)	$V_{GS} = \pm 20 V$			± 100	nA

ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$ $I_D = 250 \mu A$	2	3	4	V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS} = 10V$ $I_D = 18 A$		0.032	0.04	Ω
$I_{D(on)}$	On State Drain Current	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $V_{GS} = 10 V$	36			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$g_{fs} (*)$	Forward Transconductance	$V_{DS} > I_{D(on)} \times R_{DS(on)max}$ $I_D = 18 A$	7	15		S
C_{ISS}	Input Capacitance	$V_{DS} = 25 V$ $f = 1 MHz$ $V_{GS} = 0$		2115	2800	pF
C_{OSS}	Output Capacitance			260	350	pF
C_{RSS}	Reverse Transfer Capacitance			65	90	pF

ELECTRICAL CHARACTERISTICS (continued)

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on Time Rise Time	$V_{DD} = 30\text{ V}$ $I_D = 18\text{ A}$ $R_G = 4.7\Omega$ $V_{GS} = 10\text{ V}$		28 85	40 115	ns ns
$(di/dt)_{on}$	Turn-on Current Slope	$V_{DD} = 48\text{ V}$ $I_D = 36\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 10\text{ V}$		250		A/ μ s
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	$V_{DD} = 48\text{ V}$ $I_D = 36\text{ A}$ $V_{GS} = 10\text{ V}$		50 13 18	70	nC nC nC

SWITCHING OFF

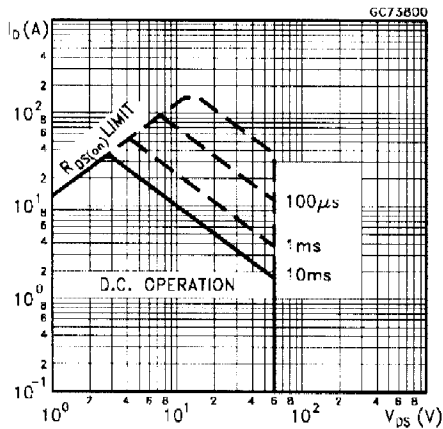
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{r(Voff)}$ t_f t_c	Off-voltage Rise Time Fall Time Cross-over Time	$V_{DD} = 48\text{ V}$ $I_D = 36\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 10\text{ V}$		12 25 40	16 35 55	ns ns ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} $I_{SDM}(\bullet)$	Source-drain Current Source-drain Current (pulsed)				36 144	A A
$V_{SD} (*)$	Forward On Voltage	$I_{SD} = 36\text{ A}$ $V_{GS} = 0$			1.5	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	$I_{SD} = 36\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$ $V_{DD} = 30\text{ V}$ $T_J = 150\text{ }^\circ\text{C}$		75 245 6.5		ns μ C A

(*) Pulsed: Pulse duration = 300 μ s, duty cycle 1.5 %
 (•) Pulse width limited by safe operating area

Safe Operating Area for TO-220



Safe Operating Area for TO-220FP

